ENVIRONMENTAL ASSESSMENT

2013 Kudzu Management Project For Indiana

Indiana Department of Natural Resources
Division of Entomology & Plant Pathology

June 2013

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1.0 PURPOSE AND NEED FOR ACTION

1.1 Proposed Action

The Indiana Department of Natural Resources (IDNR), Division of Entomology and Plant Pathology proposes a project to treat kudzu populations in late summer or autumn of 2013. The proposed action includes 51 sites in 20 counties in Indiana which totals an estimated 59.82 acres (Table 1 below and maps in Appendix B).

Table 1. Number of Treatment Sites and Acres by County for 2013.

COUNTY	TREATMENT SITES	TREATMENT ACRES
Clark	6	2.85
Crawford	3	1.23
Clay	2	7.56
Dubois	6	4.22
Floyd	1	1.02
Gibson	2	2.10
Greene	2	1.33
Harrison	2	2.71
Jennings	8	6.20
Johnson	1	0.64
Lawrence	4	1.52
Martin	4	2.71
Morgan	1	1.45
Orange	1	1.55
Posey	1	0.65
Sullivan	2	5.89
Vanderburgh	1	3.00
Vigo	1	1.00
Warrick	2	9.59
Washington	1	2.60
Total Proposed Project	51	59.82

1.2 Project Objectives

The objectives of this proposed project are to; 1) eradicate kudzu populations from the proposed treatment sites to prevent populations from spreading in the State of Indiana, 2) manage kudzu population growth in the proposed treatment sites if eradication is not feasible, and 3) decrease kudzu leaf surface area to reduce potential reservoirs for invasive insects and pathogens.

1.3 Need for Action

Kudzu (*Pueraria lobata*) is a non native plant species to the United States. Kudzu populations out-compete native plant species and eventually replace native species because of the lack of effective natural enemies here in the United States. This change in plant habitat can cause the loss of habitat and food for existing wildlife, alter soil chemistry and structure, replace and possibly lead to the local extinction of native sensitive, threatened or endangered species, increase ozone levels, and harbor pathogenic plant diseases or invasive insect species which may spread to other plant species.

Kudzu is a host plant for Asian soybean rust (*Phakopsora pachyrhizi*) which has been shown to reduce soybean yields from 10 to 80% (CRS 2005). It is also a host for the non native bean plataspid (*Megacopatera cribraria*) which has shown to cause crop loss of up to 50% in soybeans and other legumes in its native region (USDA 2010).

Mechanical and cultural control methods alone for kudzu often fail because of the quick growth rate of the plants. Kudzu vines can grow one foot per day (Alabama Coop. Extension 1999) and cover trees and shrubs, leading to decline and death. Populations left untreated eventually spread beyond accessible control methods for landowners and can impose significant costs. Seven sites occur on Indiana Classified Forest or Wildlands and landowners may find it necessary to control invasive plant species for wildlife management, native plant preservation, or for access to areas for timber stand management.

Survey of proposed treatment sites in Indiana has shown that sites left untreated continue to grow at a high rate. Sites in Indiana that have went untreated over a five year period have on average a 170% to 290% increase from the original measured acreage. The Indiana DNR, Division of Entomology and Plant Pathology documented 147 kudzu sites in 38 counties covering approximately 137.54 acres. Approximately 68.7% of the sites are less than one acre; however there are sites as large as nearly eight acres. Sites proposed for treatment in 2013 include sites which are still possible to eradicate and sites which have increased in size and need to be managed in order to prevent those sites from spreading to adjacent lands.

The Indiana Department of Natural Resources, Division of Entomology and Plant Pathology is dedicated to protecting natural resources and preventing the spread of invasive species. If no action is taken, kudzu populations will continue to spread and displace native species.

Therefore, the "No action" alternative is not preferred due to the desire of state officials to eradicate kudzu populations from the proposed treatment sites, manage kudzu population growth in the proposed treatment sites if eradication is not feasible, and decrease kudzu leaf surface area to reduce potential reservoirs for invasive insects and pathogens. Indiana Administrative Code 312 IAC 18-3-16(f) declares that kudzu (*Pueraria lobata*) is a pest in the State of Indiana and is subject to elimination from a property.

1.4 Decisions to be Made and Responsible Officials

The preferred alternative in this document proposes that the IDNR treat populations of kudzu in Indiana. The decision to be made by the responsible IDNR official is to choose which of the

alternatives presented in this document best meets the objective of the proposed action, and thus the needs of the people of Indiana. In addition, the decision will have to be made as to whether or not any significant environmental impacts could result from the implementation of this project. If there are none, this will be documented in a Decision Notice and Finding of No Significant Impact (FONSI). If significant environmental impacts are found and the project is to continue, an Environmental Impact Statement (EIS) would be prepared.

The alternatives analyzed for this environmental assessment are:

1) No action (no proposed project)
2) Treatment with clopyralid
3) Treatment with glyphosate
4) Treatment with metsulfuron-methyl
5) Treatment with clopyralid, glyphosate, and/or metsulfuron-methyl

The responsible official for the implementation of the cooperative project in the Indiana DNR is:

Philip T. Marshall, State Entomologist, Indiana Department of Natural Resources, Division of Entomology and Plant Pathology, 402 West Washington Street, IGC South, Room W290, Indianapolis, IN 46204, (317) 232-4120.

1.5 Scope of the Analysis

This document is a site specific analysis of the alternatives and environmental impacts of treating kudzu populations in Indiana. This document supports Indiana Environmental Policy (IC 13-12-3) and evaluation of State projects through the environmental assessment process (IC 13-12-4). Federal funding is not utilized by the State of Indiana to implement this project and therefore, it is not subject to the environmental analysis required of The National Environmental Policy Act (NEPA) of 1969 (P.L. 91-190), 42 USC 4321 et. seq.

1.6 Summary of Public Involvement and Notification

A total of 56 landowners were contacted and notified of the proposed treatment. The notification process to landowners involved a combination of direct personal contact, phone and mailings. Of these landowners, 45 voluntarily signed an agreement allowing the proposed treatment to occur on their property. Nine additional landowners gave verbal permission allowing treatments to occur on their property. Two additional landowners were notified through the IDNR, Division of Entomology and Plant Pathology, per Right of Entry Codes and the authority of the Division to control invasive species.

Information gathered from landowners, resource professionals and technical literature was used to develop issues and concerns related to the proposed project. They are grouped into two categories; 1) issues used to formulate alternatives, and 2) other issues and concerns.

1.7 Issues Used to Formulate the Alternatives

Each of the major issues is introduced in this section. Discussion pertaining directly to each issue as it relates to the alternatives can be found in Chapter 4.

Issue 1 – Effects on Nontarget Organisms and Environmental Quality. The major concerns under this issue are: 1) the impact of treatment materials to nontarget organisms, including threatened and endangered species, and susceptible plant species that may be in the treatment sites, 2) translocation of treatment materials from the site into adjacent soil, water and air, 3) potential soil erosion from removal of kudzu, and 3) the future impacts of kudzu populations on the natural resources.

Issue 2 – Human Health and Safety. The major concern under this issue is the potential effect of the treatment materials on humans.

Issue 3 – Likelihood of Success of the Project. The objectives of this proposed project are to; 1) eradicate kudzu populations from the proposed treatment sites to prevent populations from spreading in the State of Indiana, 2) manage kudzu population growth in the proposed treatment sites if eradication is not feasible, and 3) decrease kudzu leaf surface area to reduce potential reservoirs for invasive insects and pathogens. Alternatives vary in their likelihood for success for the current project.

Issue 4 – Economic and Political Impacts of Treatment vs. Non-Treatment. Kudzu populations can have significant economic impacts due to increasing costs over time of landowners to manage the spread of this invasive plant across their property. The spread of kudzu into a site can make access into and use of that land difficult for recreational use, wildlife management or timber management. The increase in kudzu populations within the State of Indiana increases the amount of kudzu leaf surface area available to serve as a potential reservoir for invasive insects and pathogens. These invasive species can result in economic losses for soybean growers.

1.8 Other Concerns and Questions

Other agencies were consulted (see Appendix B). Information from these sources was used to develop management guidelines, treatment constraints, and mitigating measures.

1.9 Summary of Authorizing Laws and Policies

State.
The Division Director (State Entomologist) may cooperate with a person in Indiana to locate, check, or eradicate a pest or pathogen (Indiana Code 14-24-2-1). Kudzu is declared a pest and is subject to elimination from a property under 312 IAC 18-3-16(f).

Indiana Code 13-12-3 (Environmental Policy) and Indiana Code 13-12-4 (Environmental Impact Statements) apply to this project.

Pesticide applicators must meet Indiana Pesticide Use and Application Law (Indiana Code 15-3-3.6) to provide safe, efficient and acceptable applications of pesticides.

The Non-Game and Endangered Species Conservation law (Indiana Code 14-22-34) applies to this project.

The project is consistent with the objectives of the Indiana Invasive Species Council (Indiana Code 15-16-10).

The project will be conducted in compliance with Indiana Code 14-21-1-27 and 14-21-1-29 which requires that the discovery of any archaeological artifacts, features, or human remains be reported to the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology.

This project will be conducted in consideration to the Forest Stewardship Council (FSC) Policy and Standards on Chemical Pesticides in Certified Forests: Interpretation of the DSC Principles and Criteria, July 2002, FSC-IP-0001 (FSC Forest Management Standard (v1.0), July 2010) and also FSC Pesticides Policy Guidance Addendum: List Of Approved Derogations For Use Of 'Highly Hazardous' Pesticides, January 2013, FSC-GUI-30-001a V1-0 EN.

This project will be conducted in accordance with the National Pollutant Discharge Elimination System (NPDES) requirements and is operating under any actions required by the Indiana Pesticide General Permit ING870000.

Federal.
The Plant Protection Act of 2000 (7 U.S.C. section 7701 et.seq.) states that the detection, control, eradication, suppression, prevention, or retardation of the spread of plant pests or noxious weeds is necessary for the protection of the agriculture, environment, and economy of the United States.

The Federal Insecticide, Fungicide and Rodenticide Act of 1947, (7 USC 136) as amended, known as FIFRA, requires insecticides used within the United States be registered by the United States Environmental Protection Agency (EPA).

2.0 ALTERNATIVES

2.1 Process Used to Formulate the Alternatives

Staff entomologists and administration within the IDNR, Division of Entomology and Plant Pathology formulated several alternatives to manage and eradicate kudzu infestations in Indiana. Information gathered over a period of years on treatment options, environmental and safety risks, and effectiveness was evaluated. Consultation over these years with soil scientists, weed scientists, biologists and ecological restoration groups led to the development of alternatives eliminated and considered in detail. Herbicide product labels and material safety data sheets were also reviewed. (See Chapter 6 - Persons and Agencies Consulted, Appendix B – Agency Letters, Appendix C – Product Labels, and project Work & Safety Plan)

2.2 Alternatives Eliminated from Detailed Study

The following alternatives that are available were eliminated from consideration:

Treatment with dicamba. This herbicide is a broad spectrum treatment which would impact several plant species. Other herbicides with a less broad target spectrum and with less volatility (ability to evaporate readily at normal temperatures and pressures) are available which can meet one or more of the project objectives, and lessen the impact to non target species. Therefore, dicamba is not considered for this proposed project. In future projects, it may be evaluated for use.

Treatment with triclopyr. This herbicide is a broad spectrum treatment which would impact several plant species. Other herbicides with a less broad target spectrum are available which can meet one or more of the project objectives, and lessen the impact to non target species. Therefore, triclopyr is not considered for this proposed project. In future projects, it may be evaluated for use.

Treatment with picloram + 2,4-D. Using these combined herbicides would increase the risk of movement of the herbicide to non target areas. Other herbicide are available that have less volatility which can meet one or more of the project objectives, and lessen the impact to non target species. Therefore, picloram + 2,4-D is not considered for this proposed project. In future projects, it may be evaluated for use.

Treatment with aminopyralid. This herbicide was recently registered for use in the State of Indiana in 2012 and further research is needed to compare the likelihood of success, potential environmental issues, and cost effectiveness with other herbicides that are available for use. Therefore, it is not considered for this proposed project. In future projects, it may be evaluated for use.

Cultural treatment methods. A method such as plant crown removal is not considered for this proposed project because this method is not feasible from a management and labor issue. Other treatment options are available which are feasible from a management perspective and can meet one or more of the project objectives. In future projects, it may be evaluated for use.

Biological Control. Grazing with animals (such as goats) is not considered because this method is not feasible from a management and labor issue. Other treatment options are available which are feasible from a management perspective and can meet one or more of the project objectives. Additional options that are not considered are the use of pathogens or insects. The native bacteria *Psuedomonas syringae* pv. *phaseolicola* has been shown to kill young kudzu seedlings, but has demonstrated limited secondary infections which would attack older plants (Zidak and Backman 1996). This bacteria will also infect soybeans. Another pathogen that has shown potential for control is the native fungus *Myrothecium verrucaria*. Research has shown that this fungus can provide 95-100% control of kudzu approximately 14 days after inoculation of girdled stems (Boyette *et al*. 2000). Additional pathogens and also insects are being researched as possible controls for kudzu; however, many of these species are not native to the U.S., and are not selective in the plants they attack. More research is needed to develop suitable pathogens for commercial use. Therefore, the use of pathogens or insects for control of kudzu is not considered because these options are not currently available and/or will attack soybeans and other non target plants. In future projects, it may be evaluated for use.

2.3 Alternatives Considered in Detail

Alternative 1 - No action (no proposed project). If no action is taken, kudzu populations would continue to expand from the proposed sites and spread throughout the State of Indiana. Spread of kudzu populations would provide increased leaf surface area for invasive insects and pathogens, and pose a threat to soybean crops. Advancement of these kudzu populations would also contribute to the displacement of native species. This is not a preferred alternative because it does not meet any of the objectives set forth in this proposed project, nor does it meet the responsibilities of the Indiana Department of Natural Resources and landowners to eliminate kudzu under 312 IAC 18-3-16.

Alternative 2 - Treatment with clopyralid. This treatment option uses a liquid formulation of clopyralid mixed with water for one foliar application applied from the ground at a rate of 22 ounces per 100 gallons of solution. The application would occur when plants are most vulnerable, which is usually between early August and late September in Indiana. A nonionic spreader adjuvant/surfactant (NIS surfactant or Invade 90 activator) is regularly added to increase the activity and effectiveness of the herbicide by improving adhesion of the product to the plant surface. A non-staining spray dye (Trail Lite 264 or Super Marking Blue Dye) is also added to help monitor where applications have been made during the treatment. All active ingredient products, adjuvants/surfactants and dyes are used in accordance with their product labels.

Clopyralid is an Auxin Growth Regulator. This type of herbicide kills the target plant by mimicking the plant growth hormone auxin (indole acetic acid), and when administered at effective doses, cause uncontrolled and disorganized plant growth that leads to plant death.

Clopyralid has proven effective at reducing and/or eradicating kudzu populations. Treatment with clopyralid can meet one or more of the project objectives.

Alternative 3 - Treatment with glyphosate. This treatment option uses a liquid formulation of glyphosate mixed with water for one foliar and/or stump cut application (this involves cutting the woody vine and applying the herbicide to the freshly exposed surface of the cut vine stump) applied from the ground at a rate of 3% for foliar application and a rate of 50% solution for cut stump application. The application would occur when plants are most vulnerable, which is usually between early August and late September in Indiana. A nonionic spreader adjuvant/surfactant (NIS surfactant or Invade 90 activator) is regularly added to increase the activity and effectiveness of the herbicide by improving adhesion of the product to the plant surface. A non-staining spray dye (Trail Lite 264 or Super Marking Blue Dye) is also added to help monitor where applications have been made during the treatment. All active ingredient products, adjuvants/surfactants and dyes are used in accordance with their product labels.

Glyphosate is an Aromatic Amino Acid Inhibitor. This type of herbicide kills the target plant by inhibiting the production of essential amino acids required for nutrient transport and plant growth.

Glyphosate has proven effective at reducing and/or eradicating kudzu populations. Treatment with glyphosate can meet one or more of the project objectives.

Alternative 4 - Treatment with metsulfuron-methyl. This treatment option uses a granular formulation of metsulfuron-methyl mixed with water for one foliar application applied from the ground at a rate of 4 ounces per 100 gallons of solution. The application would occur when plants are most vulnerable, which is usually between early August and late September in Indiana. A nonionic spreader adjuvant/surfactant (NIS surfactant or Invade 90 activator) is regularly added to increase the activity and effectiveness of the herbicide by improving adhesion of the product to the plant surface. A non-staining spray dye (Trail Lite 264 or Super Marking Blue Dye) is also added to help monitor where applications have been made during the treatment. All active ingredient products, adjuvants/surfactants and dyes are used in accordance with their product labels.

Metsulfuron-methyl is an ALS Inhibitor. This type of herbicide kills the target plant by inhibiting cell division in the shoots and roots of the plant.

Metsulfuron-methyl has proven effective at reducing and/or eradicating kudzu populations. Treatment with metsulfuron-methyl can meet one or more of the project objectives.

Alternative 5 - Treatment with clopyralid, glyphosate, and/or metsulfuron-methyl. The use of this alternative utilizes an Integrated Pest Management type approach to select clopyralid, glyphosate, or metsulfuron-methyl alone or in combination for each site based on the following criteria: 1) presence of water sources, 2) soil type, content, and slope, 3) safety to people, 4) safety to nontarget organisms and 5) ability to meet project goals.

2.4 Comparative Summary of Alternatives

Table 2. Summary of Environmental Consequences for Alternatives by Issues from Chapter 4.

	Issue 1 Effects on Nontarget Organisms & Environmental Quality (pgs. 29-31)	**Issue 2** Human Health & Safety (pgs. 31-32)	**Issue 3** Likelihood of Success of the Project (page 32-33)	**Issue 4** Economic and Political Impacts (pgs. 33)
Alternative 1 No action	- Increased loss potential of native species. - kudzu populations continue to spread - increased leaf surface area for invasive pests - increased risk to soybean and legume crops - no risk of accident or spill	- no risk of accident or spill - no risk of human exposure to herbicides	- spread of kudzu populations would not be slowed and the project objectives would not be met	- spread of kudzu would not be slowed - increased cost to landowners - increased risk to soybean and legume industry
Alternative 2 Clopyralid	- risk of injury to some nontarget plant families - cannot be applied directly to water or where surface water is present - slight risk of accident or spill	- slight risk of accident or spill - exposure to skin may cause slight irritation and redness - inhalation of mist may irritate upper respiratory tract - may cause eye, nose, throat irritation - excessive exposure may aggravate preexisting lung disease	- success is likely at all sites with varying density populations - 38 of the 51 sites have water sources and clopyralid alone cannot be used at these sites	- slows the spread of kudzu - decreased cost to landowners - decreased availability of host material to invasive species and the resulting potential economic damage
Alternative 3 Glyphosate	- risk of injury to nontarget plants - slight risk of accident or spill	- slight risk of accident or spill - may cause slight irritation to eye and skin - prolonged overexposure may effect liver	- success is likely at sites with medium to low density populations (45 sites)	- slows the spread of kudzu - decreased cost to landowners - decreased availability of host material to invasive species and the resulting potential economic damage
Alternative 4 Metsulfuron-methyl	- risk of injury to nontarget plants - cannot be applied directly to water or where surface water is present - slight risk of accident or spill	- slight risk of accident or spill - exposure to eye and skin may cause irritation with pain, redness, rash, itching, swelling and visual impairment	- success is likely at low density sites that have been treated previously	- slows the spread of kudzu - decreased cost to landowners - decreased availability of host material to invasive species and the resulting potential economic damage
Alternative 5 Clopyralid, Glyphosate and/or Metsulfuron-methyl	- same as alternative 2, 3 or 4	- same as alternative 2, 3 or 4	- success is likely at all sites	- slows the spread of kudzu - decreased cost to landowners - decreased availability of host material to invasive species and the resulting potential economic damage

3.0 AFFECTED ENVIRONMENT

3.1 Description of the Proposed Treatment Sites

(See Table 2. Definitions for Descriptions of Proposed Treatment Sites).

Description of the Proposed Treatment Sites

Clark-2: The proposed treatment site contains 0.14 acres. The site is composed of Sugar Maple, Ash, Virginia Pine, Oak, American Sycamore and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. Cattle graze close to the site. The site is small and located on top of a hill with a limited flow of water running into the site. A creek occurs 0.25 miles southwest of the site. The soil types at the site are Ryker-Grayford Silt Loam (RztC2) (6-12% slopes, eroded), Haggatt-Caneyville Silt Loam (HtwD2) (12-25% slopes, eroded) and Haggatt-Caneyville Complex (HtzD3) (12-25% slopes, severely eroded). The Ryker-Grayford series of soils consists of deep, well drained soils. Permeability is moderate and the potential for surface water runoff is low to high. The Haggatt-Caneyville series of soils consists of moderately deep to deep, well drained soils. Permeability is moderately slow to slow and the potential for surface water runoff is medium to very high. No houses occur on the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Clark-3: The proposed treatment site contains 0.64 acres. The site is composed of Maple, Walnut, Pine, Yellow Poplar, American Elm and other species of trees, shrubs and plants. No legumes occur within the site. The vascular plant *Lechea racemulosa* (Illinois Pinweed) (Family: Cistaceae) is an Indiana State Endangered plant species that has been previously identified by DNR staff at the site. The site is located along a stream bank, and has a risk of flooding. The soil types at the site are Beanblossum Silt Loam (BcrAW) (1-3% slopes, occasionally flooded, very brief duration) and Gilwood-Brownstown Silt Loam (GgbG) (25-75% slopes). Beanblossum Silt Loam and Gilwood-Brownstown Silt Loam series of soils consist of deep, well drained soils. The potential for surface water runoff in Beanblossum Silt Loam is very low to low and medium to high in Gilwood-Brownstown Silt Loam. Permeability is moderate to rapid in both. No houses occur on the site. The site has had no prior treatment. This site has a low density population and Glyphosate is proposed for 2013. Glyphosate will be applied as a foliar treatment. Thus, there is a low risk of erosion potential at the site.

Clark-4: The proposed treatment site contains 1.36 acres. The site is composed of Flowering Dogwood, American Beech, Ash, Oak, Black Cherry and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at the site are Knobcreek-Navilleton-Haggett Silt Loam (KxoC2) (karst, rolling, eroded) and Crider-Bedford-

Navilleton Silt Loam (CtwB) (2-6% slopes). The Knobcreek-Navilleton-Haggett series of soils consists of deep, well drained soils. Permeability is slow to moderate and the potential for surface water runoff is high. Crider-Bedford-Navilleton series of soils consists of generally very deep, moderately well to well drained soils. Permeability is generally moderate above the fragipan and slow in the fragipan. The potential for surface water runoff is medium. A soil erosion plan is developed for this site to manage any soil erosion which may occur after kudzu is removed. The erosion plan consists of seeding with 84 lbs./acre of cereal rye after treatment and frost seeding with 35 lbs./acre of fescue. No houses occur on the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a high risk of erosion potential at the site.

Clark-5: The proposed treatment site contains 0.32 acres. The site is composed of Silver Maple, Honeysuckle, Multiflora Rose and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil type at the site is Urban land-Udarents (UnpA) (loamy substratum, complex terrace, 0-3% slopes). The drainage, permeability and potential for surface water runoff can vary greatly on Urban land Udarent soil sites because the natural soils have been disturbed. Soil drainage at this site is likely moderately well drained. Permeability is unknown and the potential for surface water runoff is likely low. No houses occur on the site, but a mobile home park is immediately north of the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Clark-6: The proposed treatment site contains 0.02 acres. The site is composed of American Sycamore, American Sweetgum, Eastern Redbud and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil type at the site is Urban land-Udarents (UngB) (fragipan substratum, complex, till plain, 0-12% slopes). The drainage, permeability and potential for surface water runoff can vary greatly on Urban land Udarent soil sites because the natural soils have been disturbed. Soil drainage at this site is likely moderately well drained. Permeability is unknown and the potential for surface water runoff is likely low. No houses occur on the site, but a golf course is adjacent to the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Clark-7: The proposed treatment site contains 0.37 acres. The site is composed of Sugar Maple, Black Walnut, American Elm, Virginia Pine and other species of trees, shrubs and plants. No legumes occur within the site. This site occurs within Indiana Classified Forest or Wildlands property. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at the site are Trappist Silty Clay Loam (ThbD5) (6-18% slopes, gullied) and Deputy-Trappist Silt Loam (DtvC2) (6-12% slopes, eroded). The Trappist and Deputy-Trappist series of soils consist of moderately well drained to well drained soils. Permeability is slow to moderate and the potential for surface water runoff is high. There is native vegetation growing near the kudzu site, limited slope and limited water flow running through the site. No houses occur on the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate is proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Crawford-4: The proposed treatment site contains 0.17 acres. The site is composed of Red Maple, White Ash, Black Cherry and other species of trees, shrubs and plants. No legumes occur within the site. This site occurs within Indiana Classified Forest or Wildlands property. 2013 Early Coordination Review with Indiana DNR, Division of Fish and Wildlife has documented the state threatened plant *Bacopa rotundifolia* (roundleaf water-hyssop) (Family: Scrophulariaceae) within a half mile of the site. A drainage ditch occurs within the site. The soil type at the site is Apalona Silt Loam (AgrC2) (6-12% slopes, eroded). The Apalona series of soils consists of very deep, moderately well drained soils. Permeability is moderate above the fragipan and very slow in the fragipan and below. The potential for surface water runoff is medium to very high. No houses occur on the site. The site was treated in 2011 with Clopyralid and with Clopyralid and Glyphosate in 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a moderate risk of erosion potential at the site.

Crawford-5: The proposed treatment site contains 0.83 acres. The site is composed of Red Maple, White Ash, Virginia Pine, American Sycamore and other species of trees, shrubs and plants. No legumes occur within the site. This site occurs within Indiana Classified Forest or Wildlands property. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil type at the site is Udorthents Soils (UbxD) (6-18% slopes, gullied). The Udorthent series of soils consists of moderately well drained to well drained soils. Permeability varies from very low to high. The potential for surface water runoff is medium to very high. No houses occur on the site. The site was treated in 2012 with Clopyralid and Glyphosate. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large

vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Crawford-6: The proposed treatment site contains 0.23 acres. The site is composed of White Ash, Eastern Red Cedar, Yellow Foxtail, Canada goldenrod and grasses. Legumes occur within the site. No threatened or endangered species are known to occur within the site. The site mostly lies on top of a sloped area, with surface water near to the site. The soil type at the site is Pits, Quarry (Pml). The drainage, permeability and potential for surface water runoff can vary greatly on Pits, Quarry soil sites because the natural soils have been highly disturbed. The potential for surface water runoff is likely moderate at this site. Permeability and drainage are unknown. No houses occur on the site. The site has had no prior treatment. The site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Clay-5: The proposed treatment site contains 7.00 acres. The site is composed of Maple, American Beech, Tulip Poplar, Pitch Pine, American Sycamore, Oak and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. Ponds occur within the site. The soil type at this site is Fairpoint Shaly Silty Clay Loam (FcG) (33-90% slopes). The Fairpoint series of soils consists of well drained soils. Permeability is very low to moderately high. The potential for surface water runoff is very high. The site has wide varying and steep slopes. No erosion plans are needed at this site because it has been treated in stages with selective herbicides that preserved native vegetation. No houses occur on the site. This site was treated with Clopyralid in 2008 and 2009 and treated with Clopyralid and Glyphosate in 2010 to 2012. This site has a medium density population and Clopyralid, Glyphosate and Metsulfuron are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment Thus, there is a severe risk of erosion potential at the site however the staged treatments have managed erosion risk.

Clay-6: The proposed treatment site contains 0.56 acres. The site is composed of White Ash, Eastern Red Cedar, Eastern Cottonwood, American Sycamore, Multiflora Rose and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. A ditch which could contain periodic water runs through the center of the site. The soil types at this site are Fairpoint Shaly Silt Loam (FcB) (0-8% slopes), Hickory Loam (HcF) (30-70% slopes) and Muren Silt Loam (MuB2) (2-6% slopes, eroded). These soil series types consist of well drained soils. The Muren Silt Loam and Hickory Loam soil series have moderate permeability, and the Fairpoint Shaly Silt Loam has very low to moderately high permeability. The potential for surface water runoff is high to very high in these soils. No houses occur on the site. The site was treated with Clopyralid in 2009 to

2011. The site has a medium density population and Glyphosate and Metsulfuron are proposed for 2013. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a moderate risk of erosion potential at the site.

Dubois-1: The proposed treatment site contains 1.20 acres. The site is composed of Flowering Dogwood, Virginia Pine, Oak, American Elm and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. A dry stream occurs within the site. The soil type at this site is Fairpoint Shaly Silt Loam (FcB) (0-8 % slopes). The Fairpoint Shaly Silt Loam series of soils consist of well drained soils. Permeability is very low to moderately high. The potential for surface water runoff is very high. No houses occur on the site. The site was treated with Clopyralid in 2009, and treated with Clopyralid and Glyphosate in 2010 to 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a moderate risk of erosion potential at the site.

Dubois-2: The proposed treatment site contains 2.41 acres. The site is composed of Flowering Dogwood, Black Walnut, White Oak, American Elm, Shagbark Hickory and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. A dry stream occurs within the site. The soil type at this site is Fairpoint Shaly Silt Loam (FcB) (0-8% slopes). The Fairpoint Shaly Silt Loam series of soils consist of well drained soils. Permeability is very low to moderately high. The potential for surface water runoff is very high. No houses occur on the site. The site was treated with Clopyralid in 2009, and treated with Clopyralid and Glyphosate in 2010 to2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a moderate risk of erosion potential at the site however the prior treatments have managed erosion risk and no erosion plan will be used.

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Dubois-3: The proposed treatment site contains 0.05 acres. The site is composed of Red Maple, Red Oak and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil type at this site is Gilpin-Berks Complex (GoF) (20-50% slopes). Gilpin-Berks Complex series of soils consists of well drained soils. Permeability is moderate to moderately rapid. The potential for surface water runoff is negligible to high. No houses occur on the site. The site was treated with Clopyralid in 2011 and Clopyralid and Glyphosate in 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective

manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is low risk of erosion potential at the site.

Dubois-4: The proposed treatment site contains 0.43 acres. The site is composed of White Ash, Red Oak, Shortleaf Pine, Virginia Pine, Shagbark Hickory, Eastern Redbud and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. An erosion ditch which may contain periodic water occurs within the site. The soil type at this site is Gilpin-Berks Complex (GoF) (20-50% slopes). Gilpin-Berks Complex series of soils consists of well drained soils. Permeability is moderate to moderately rapid. The potential for surface water runoff is negligible to high. Native vegetation exists at the site and can be preserved with the use of selective herbicides and selective application of herbicides. No houses occur on the site. The site was treated with Clopyralid in 2011 and Clopyralid and Glyphosate in 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Dubois-5: The proposed treatment site contains 0.10 acres. The site is composed of Red Maple, Red Oak and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Gilpin-Berks Complex (GoF) (20-50% slopes) and Gilpin Silt Loam (GID3) (12-18% slopes, severely eroded). The Gilpin-Berks Complex and Gilpin Silt Loam series of soils consists of well drained soils. Permeability is moderate to moderately rapid. The potential for surface water runoff is negligible to high. No houses occur on the site. The site has had no prior treatment. The site has a high density population and Clopyralid is proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Thus, there is a low risk of erosion potential at the site.

Dubois-6: The proposed treatment site contains 0.03 acres. The site is composed of White Ash, Red Oak, Shortleaf Pine, Virginia Pine, Shagbark Hickory, Eastern Redbud and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. An erosion ditch which may contain periodic water occurs within the site. The soil types at this site are Gilpin-Berks Complex (GoF) (20-50% slopes) and Gilpin Silt Loam (GID3) (12-18% slopes, severly eroded). The Gilpin-Berks Complex and Gilpin Silt Loam series of soils consists of well drained soils. Permeability is moderate to moderately rapid. The potential for surface water runoff is negligible to high. No houses occur on the site. The site has had no prior treatment. The site has a high density population and Clopyralid is proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Thus, there is a low risk of erosion potential at the site.

Floyd-4: The proposed treatment site contains 1.02 acres. The site is composed of Tulip Poplar, Red Oak, Flowering Dogwood, Eastern Redbud, Black Locust, Multiflora Rose and other species of trees, shrubs and plants. Legumes occur within the site. The site occurs on a DNR Nature Preserve property. No threatened or endangered species are known to occur within the site. A small pond exists on the north side of the site and a creek runs along the west side of the site. The soil type at this site is Gnawbone-Kurtz Silt Loam (GmaG) (20-60% slopes). The Gnawbone-Kurtz series of soils consists of well drained soils. Permeability is moderate. The potential for surface water runoff is medium to high. No houses occur on the site. The site has had no prior treatment. The site has a high density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Gibson-1: The proposed treatment site contains 1.66 acres. The site is composed of Ash, Black Walnut, Black Cherry, Honeysuckle, Honey Locust, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. This site occurs adjacent to soybean fields. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Alford Silt Loam (AlC3) (6-12% slopes, severely eroded), Sylvan Silt Loam (SyC3) (6-12% slopes, severely eroded) and Alford Silt Loam (AlB2) (2-6% slopes, eroded). The Alford Silt Loam and Sylvan Silt Loam series of soils consist of well drained soils. Permeability is moderate. The potential for surface water runoff is low to very high in Alford series soils and medium to high in Sylvan series soils. There is a limited flow of water into and through the site and selective herbicides will preserve the native vegetation. No houses occur on the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Gibson-3: The proposed treatment site contains 0.44 acres. The site is composed of Sugar Maple, Black Walnut, American Elm, Locust species and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil type at this site is Alford Silt Loam (AlB2) (2-6% slopes, eroded). The Alford Silt Loam series of soils consist of well drained soils. Permeability is moderate. The potential for surface water runoff is low to very high. A soil erosion plan is developed for this site to manage any soil erosion which may occur after kudzu is removed. The erosion plan consists of seeding with 84 lbs./acre of cereal rye after treatment and frost seeding with 35 lbs./acre of fescue. A house occurs on the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will

also allow for future increased site accessibility and selective cut stump treatments. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a high risk of erosion potential at the site.

Greene-1: The proposed treatment site contains 0.14 acres. The site is along a road right of way and there are no trees or shrubs present. No threatened or endangered species are known to occur within the site. No legumes occur within the site. No water sources occur within the site. The soil type at this site is Ava Silt Loam (AvB2) (2-6% slopes, eroded). The Ava Silt Loam series of soils consist of moderately well drained soils. Permeability is moderate in the upper part of the solum and very slow in the fragipan. The potential for surface water runoff is high. No houses occur on the site. The site was treated in 2009 and 2010 with Clopyralid. This site has a high density population and Metsulfuron is proposed for 2013. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Greene-4: The proposed treatment site contains 1.19 acres. The site is composed of Tulip Poplar, American Elm, Pine, Sugar Maple, Flowering Dogwood and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. The soil types at the site are Ava Silt Loam (AvB2) (2-6% slopes, eroded), Fairpoint Very Parachannery Loam (FcG) (35-90% slopes) and Hickory Silt Loam (HeE) (18-25% slopes). Permeability is moderate in these soil series. The Hickory Silt Loam and Fairpoint Very Parachannery Loam series consist of well drained soils. The Ava Silt Loam series of soil consists of moderately well drained soils. The potential for surface water runoff in Ava Silt Loam and Fairpoint Very Parachannery Loam is high to very high, and medium to very high in Hickory Silt Loam. No houses occur on the site. The site was treated in 2007 to 2010 with Clopyralid and with Clopyralid and Glyphosate in 2011. This site has a medium density population and Glyphosate and Metsulfuron are proposed for 2013. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Harrison-6: The proposed treatment site contains 2.69 acres. The site is composed of Maple, Flowering Dogwood, Oak, Black Cherry, Sassafras and other species of trees, shrubs and plants. No legumes occur within the site, but this site occurs adjacent to soybean fields. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Vertrees Crider Caneyville Complex (VcaC3) (karst, rolling, severely eroded), Vertrees Haggatt Caneyville Complex (VccD3) (karst, hilly, severely eroded) and Vertrees Crider Caneyville Silt Loam (VcbD2) (karst, hilly, eroded). These soil series consist of well drained soils. The potential for surface water runoff of these soils varies from low to high. Permeability is moderately slow to moderate. No houses occur on the site, but a house occurs approximately a fourth mile from the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for

future increased site accessibility and selective cut stump treatments. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Harrison-12: The proposed treatment site contains 0.02 acres. The site is composed of grasses and Engelmann's Adder's-tongue plant is present. No legumes occur within the site. No trees occur on the site. No threatened or endangered species are known to occur within the site. No water occurs on the site. The soil types at this site are Caneyville-Haggatt-Knobcreek Silt Loam (CbrD2) (karst, hilly, eroded) and Deuchars-Apalona-Wellston Silt Loam (DeaC2) (6-12% slopes, eroded). These soils consist of moderately well drained to well drained. The potential for surface water runoff on these soils is medium to very high. Permeability is moderate to moderately slow. No houses occur on the site. The site has had no prior treatment. The site has a high density population and Clopyralid is proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Thus, there is a low risk of erosion potential at the site.

Jennings-1: The proposed treatment site contains 1.01 acres. The site is composed of Sassafras, Red Maple, White Ash, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. A drainage system and culverts occur adjacent to the site. The soil type at this site is Cobbsfork Silt Loam (ClfA) (0-1% slopes). The Cobbsfork Silt Loam series of soils consists of poorly drained soils. Permeability is moderate or moderately slow above the horizon with fragic soil properties and is slow or very slow in and below the horizon with fragic soil properties. The potential for surface water runoff is low to negligible. The site occurs on CSX Railroad land. No houses occur on the site. The site was treated with Clopyralid in 2009 to 2010, and was treated with Clopyralid and Glyphosate in 2011 and with Clopyralid in 2012. This site has a medium density population and Clopyralid, Glyphosate and Metsulfuron are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Jennings-2: The proposed treatment site contains 0.50 acres. The site is composed of Red Maple, Eastern Red Cedar, American Elm, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered are known to occur within the site. A drainage system and culverts occur adjacent to the site. The soil type at this site is Cobbsfork Silt Loam (ClfA)(0-1% slopes). The Cobbsfork Silt Loam series of soils consists of poorly drained soils. Permeability is moderate or moderately slow above the horizon with fragic soil properties and is slow or very slow in and below the horizon with fragic soil properties. The potential for surface water runoff is low to negligible. The site occurs on CSX Railroad land. No houses occur on the site. The site was treated with Clopyralid in 2009 to 2010, and was treated with Clopyralid and Glyphosate in 2011 and with Clopyralid in 2012. This site has a medium density population and Clopyralid, Glyphosate and Metsulfuron are proposed for 2013.

Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Jennings-5: The proposed treatment site contains 0.65 acres. The site is composed of Maple, Ash, Tulip Poplar, Red Oak, Sassafras, Multiflora Rose and other species of trees, shrubs and plants. No legumes occur within the site. No water occurs on the site. No threatened or endangered species are known to occur within the site. The soil types at this site are Bonnell-Blocher-Hickory Silt Loam (BlkE2) (12-25% slopes, eroded) and Nabb Silt Loam (NaaB2) (2-6% slopes, eroded). These soil series consist of moderately well drained to well drained soils. The potential for surface water runoff is medium to very high. Permeability is moderate to slow. No houses occur on the site. The site was treated in 2008 to 2010 with Clopyralid and treated with Glyphosate and Metsulfuron in 2011. This site has a low density population and Metsulfuron is proposed for 2013. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

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Jennings-6: The proposed treatment site contains 1.57 acres. The site is composed of Maple, Flowering Dogwood, White Pine, Oak, American Elm and other species of trees, shrubs and plants. No legumes occur within the site. This site occurs within Indiana Classified Forest or Wildlands property. No threatened or endangered species are known to occur within the site. A creek occurs 0.75 miles from the site. The soil types at this site are Blocher Cincinnati Silt Loam (BlgC3) (6-12% slopes, severely eroded), Bonnell Hickory Blocher Complex (BnuD3) (12-25% slopes, severely eroded) and Bonnell Blocher Hickory Silt Loam (BlkE2) (12-25% slopes, eroded). These series of soils consist of moderately well drained to well drained soils. The potential for surface water runoff is low to very high. Permeability is moderately slow to moderate. No houses occur on the site. This site has very difficult access. The site was treated with Clopyralid in 2009 and 2010 and with Clopyralid in 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a moderate risk of erosion potential at the site however the prior treatments have managed erosion risk and no erosion plan will be used.

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Jennings-9: The proposed treatment site contains 1.85 acres. The site is composed of Common persimmon, Maple, Ash, Black Walnut, Black Cherry, Honey Locust, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. This site occurs within Indiana Classified Forest or Wildlands property. 2013 Early Coordination Review with Indiana DNR, Division of Fish and Wildlife has documented the state species of special concern the mussel *Villosa lienosa* (little spectaclecase) within a half mile of the site. A creek occurs immediately adjacent to the site. The soil type at this site is Pekin Silt Loam (PcrC2) (6-12% slopes, eroded). Pekin Silt Loam series of soils consist of moderately well drained. The

potential for surface water runoff is medium to very high. Permeability is moderate above the fragipan and slow or very slow in the fragipan. No houses occur on the site. The site was treated with Clopyralid and Glyphosate in 2010 and 2012, and was treated with Clopyralid in 2011. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Jennings-10: The proposed treatment site contains 0.19 acres. The site is composed of Black Cherry, Red Oak, American Sycamore, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. This site occurs within Indiana Classified Forest or Wildlands property. 2013 Early Coordination Review with Indiana DNR, Division of Fish and Wildlife has documented the state species of special concern the mussel *Villosa lienosa* (little spectaclecase) within a half mile of the site. A creek occurs immediately adjacent to the site. There is also a limited flow of water into the site and native vegetation under the kudzu. The soil type at this site is Haymond Silt Loam (HcgAW) (0-2% slopes, occasionally flooded, very brief duration). The Haymond Silt Loam series of soils consist of well drained soils. The potential for surface water runoff is negligible to low. Permeability is moderate. USDA, NRCS has been consulted regarding the erosion potential of this site and the site is being monitored. The site is being treated in stages in order to prevent soil erosion. No houses occur on the site. The site was treated with Clopyralid and Glyphosate in 2010 , treated with Clopyralid in 2011, and treated with Glyphosate in 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a high risk of erosion potential at the site however the prior treatments have managed erosion risk and no erosion plan will be used.

Jennings-11: The proposed treatment site contains 0.05 acres. The site is composed of Sugar Maple, Black Cherry, Red Oak and other species of trees, shrubs and plants. No legumes occur within the site. This site occurs within Indiana Classified Forest or Wildlands property. 2013 Early Coordination Review with Indiana DNR, Division of Fish and Wildlife has documented the state species of special concern the mussel *Villosa lienosa* (little spectaclecase) within a half mile of the site. No water sources occur within the site. The soil types at this site are Bartle Silt Loam (BbhA) (0-2% slopes) and Pekin Silt Loam (PcrB2) (2-6% slopes, eroded). The Bartle Silt Loam soils consist of somewhat poorly drained soils and Pekin Silt Loam soils consist of moderately well drained soils. The potential for surface water runoff in Bartle Silt Loam is low to medium, and medium to very high in Pekin Silt Loam soils. Permeability is moderate above the fragipan and slow or very slow in the fragipan. No houses occur on the site. The site was treated with Clopyralid and Glyphosate in 2011 and 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment

and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Jennings-12: The proposed treatment site contains 0.38 acres. The site is composed of Multiflora Rose, grasses, Yellow Foxtail, Honey Locust and other species of trees, shrubs and plants. Legumes occur within the site. 2013 Early Coordination Review with Indiana DNR, Division of Fish and Wildlife has documented the State Endangered Species *Tyto alba* (barn owl) within a half mile of the site. No water sources occur within the site. The soil type at this site is Bonnell Blocher Hickory Silt Loam (BlkE2) (12-25% slopes, eroded). Bonnell Blocher Hickory Silt Loam soils consist ofmoderately well drained to well drained soils. The potential for surface water runoff is medium to very high. Permeability is moderate to moderately slow. No houses occur on the site. The site was treated with Clopyralid in 2011 and 2012. This site has a high density population and Clopyralid is proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Thus, there is a moderate risk of erosion potential at the site and the site will be monitored.

Johnson-1: The proposed treatment site contains 0.64 acres. The site is composed of Eastern Redbud, American Beech, Maples, grasses and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. The site is located between two lakes. The soil types at this site are Miami Silt Loam (MnB2) (2-6%, eroded) and Muskingum Silt Loam (MxG) (25-50% slopes). These series of soils consist of moderately well drained to well drained soils. The permeability in Miami Silt Loam is moderate in the upper part of the solum, moderately slow in the lower part of the solum, and slow or very slow in the underlying dense till. Permeability in Muskingum Silt Loam is moderate. The potential for surface water runoff in these soils is medium to high. No houses occur on the site. The site was treated with Clopyralid in 2008 and 2009 and treated with Glyphosate in 2010. This site has a low density population and Metsulfuron and Glyphosate are proposed for 2013. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Lawrence-3: The proposed treatment site contains 0.51 acres. The site is composed of Eastern Redbud, Tulip Poplar, Red Oak, Sassafras, Ferns and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil type at this site is Crider Silt Loam (CspC2) (6-12% slopes, eroded). Crider Silt Loam series of soils consist of well drained soils. The potential for surface water runoff is low to high. Permeability is moderate. No houses occur on the site. The site was treated with Clopyralid in 2006 to 2008 and with Clopyralid and Metsulfuron in 2011. This site has a low density population and Metsulfuron is proposed for 2013. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Lawrence-4: The proposed treatment site contains 0.36 acres. The site is composed of Eastern Redbud, Red Maple, White Ash, American Beech and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Adyeville-Tipsaw-Wellston Complex (AcIF) (18-50% slopes), Hosmer Silt Loam (HsaB2) (2-6% slopes, eroded) and Wellston Silt Loam (WozDJ) (10-18% slopes, gullied). These soils consist of well drained to somewhat excessively drained soils. The potential for surface water runoff is medium to high. Permeability is moderate. No houses occur on the site. The site was treated with Clopyralid in 2008 to 2010 and with Clopyralid and Glyphosate in 2011. This site has a low density population and Metsulfuron is proposed for 2013. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Lawrence-8: The proposed treatment site contains 0.33 acres. The site is composed of Flowering Dogwood, Red Oak, Tulip Poplar and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Crider Silt Loam (CspC2) (6-12% slopes, eroded) and Bedford Silt Loam (BdoB) (2-6% slopes). These series of soils consist of moderately well drained to well drained soils. The potential for surface water runoff is low to high. Permeability is moderate. A house is adjacent to the site. The site was treated with Clopyralid in 2010 and 2011 and with Clopyralid and Glyphosate in 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Lawrence-11: The proposed treatment site contains 0.32 acres. The site is composed of Red Oak, White Ash, American Sycamore, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. The site occurs a few hundred feet away from the White River. The soil type at this site is Crider Silt Loam (CspD2) (12-18% slopes, eroded). Crider Silt Loam soils are well drained. The potential for surface water runoff is low to high. Permeability is moderate. No houses occur on the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Martin-3: The proposed treatment site contains 1.61 acres. The site is composed of Oak, White Pine, Flowering Dogwood, Tulip Poplar, Eastern Redbud and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Apalona Silt Loam (AgrB) (2-6% slopes), Ebal Wellston Silt Loam (EbdD2) (10-18% slopes, eroded) and

Apalona Silt Loam (AgrC2) (6-12% slopes, eroded). These series of soils consist of moderately well drained to well drained. The potential for surface water runoff is medium to rapid. Permeability is moderate. Soil erosion prevention work was implemented in 2008. The most significant risk of soil erosion occurs in the early spring after the first year of treatment. Additional erosion work was not necessary and native vegetation has returned to the site thus reducing the risk of erosion. No houses occur on the site. The site was treated with Clopyralid and Glyphosate in 2008, 2009, 2011 and 2012. The site was treated with Glyphosate in 2010. This site has a medium density population and Clopyralid,Glyphosate and Metsulfuron are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a moderate to high risk of erosion potential at the site however the prior treatments have managed erosion risk and no erosion plan will be used.

Martin-4: The proposed treatment site contains 0.68 acres. The site is composed of Sugar Maple, American Beech, Red Oak, Flowering Dogwood and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Wellston-Tipsaw-Adyeville complex (WpfG) (18-70% slopes) and Wellston Silt Loam (WhfC2) (6-12% slopes, eroded). These series of soils consist of well drained to somewhat excessively drained soils. The potential for surface water runoff ranges from low to rapid. Permeability is moderate to moderately rapid. No houses occur on the site. The site is on U.S. Gypsum property. The site was treated with Clopyralid in 2010 and 2011 and with Clopyralid and Glyphosate in 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Martin-5: The proposed treatment site contains 0.28 acres. The site is composed of American Sycamore, American Sweetgum, Rubus species, Eastern Redbud, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Wellston-Tipsaw-Adyeville complex (WpfG) (18-70% slopes) and Gatchel Loam (GacAW) (1-3% slopes, occasionally flooded, very brief duration). These series of soils consist of well drained to somewhat excessively drained soils. The potential for surface water runoff ranges from low to rapid. Permeability is moderate to moderately rapid. No houses occur on the site. This site is on U.S. Gypsum property. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees.

Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Martin-6: The proposed treatment site contains 0.14 acres. The site is composed of Eastern White Pine, Black Cherry, Flowering Dogwood and other species of shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil type at this site is Apalona Silt Loam (AgrB) (2-6% slopes). Apalona Silt Loam series of soils are moderately well drained. The potential for surface water runoff is medium to very high. Permeability is moderate above the fragipan and very slow in the fragipan and below. Houses occur on the site. The site has had no prior treatment. This site has a high density population and Clopyralid is proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Thus, there is a low risk of erosion potential at the site.

Morgan-3: The proposed treatment site contains 1.45 acres. The site is composed of Shagbark Hickory, Red Oak, American Elm, American Beech, Black Locust and other species of trees. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Ava Silt Loam (AvB) (2-6% slopes) and Wellston Silt Loam (WfC) (6-12% slopes). These series of soils consist of moderately well drained to well drained. The potential for surface water runoff in the Ava series of soils is high and is medium to rapid in the Wellsto series of soils. Permeability is moderate in these soils. A soil erosion plan is developed for this site to manage any soil erosion which may occur after kudzu is removed. The erosion plan consists of seeding with 84 lbs/acre of cereal rye after treatment and frost seeding with 35 lbs./acre of fescue. No houses occur on the site. The site was treated with Clopyralid in 2011 and 2012. This site has a medium density population and Clopyralid and Glyphosate is proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a high risk of erosion potential at the site and an erosion plan will be used.

Orange-3: The proposed treatment site contains 1.55 acres. The site is composed of Maple, Flowering Dogwood, White Ash, Red Oak and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil type at the site is Wellston-Adyeville-Ebal Silt Loam (WppD2) (12-18% slopes, eroded). These soils consist of moderately well drained to somewhat excessively drained. The potential for surface water runoff ranges from low to rapid. Permeability is moderate. No houses occur on the site. The site was treated in 2012 with Clopyralid. This site has a medium density population and Clopyralid and Glyphosate is proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Glyphosate will be applied

in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a moderate risk of erosion potential at the site and the site will be monitored.

Posey-2: The proposed treatment site contains 0.65 acres. The site is composed of Flowering Dogwood, White Ash, Black Cherry, Oak and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. A creek occurs within the site. The soil type at the site is Wellston Silt Loam (WeE) (18-25% slopes). The Wellston series of soils is well drained. The potential for surface water runoff is medium to rapid. Permeability is moderate. No houses occur on the site. The site was treated in 2012 with Clopyralid and Glyphosate. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a moderate risk of erosion potential at the site and the site will be monitored.

Sullivan-1: The proposed treatment site contains 1.25 acres. The site is composed of Hickory, Red Maple, Ash, Red Oak, American Elm, Honey Locust, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. A drainage ditch occurs within the site. The soil type at this site is Hickory Silt Loam (HkE) (18-25% slopes). The Hickory series of soils are well drained. The potential for surface water runoff is medium to very high. Permeability is moderate. No houses occur on the site. The site was treated with Clopyralid in 2009 and 2010, and was treated with Clopyralid and Glyphosate in 2011 and 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a moderate risk of erosion potential at the site however the prior treatments have managed erosion risk and no erosion plan will be used.

Sullivan-2: The proposed treatment site contains 4.64 acres. The site is composed of Maple, Black Cherry, American Sycamore, White Willow, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. Coordination Review with Indiana DNR, Division of Fish and Wildlife has documented the State Endangered Species *Rana areolata circulosa* (northern crawfish frog) within a half mile of the site. No water sources occur within the site. The soil types at this site are Strip Mines (St) and Iva Silt Loam (IvA) (0-2% slopes). Strip Mines soils consist generally of well drained with moderately slow permeability. The potential in these soils for surface water runoff is very rapid. The Iva series of soils are somewhat poorly drained and permeability is moderate. The potential for surface water runoff is low. No houses occur on the site. Cattle graze within the site. An electric fence is within the site. The site was treated with Clopyralid in 2011 and 2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion

control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Vanderburgh-4: The proposed treatment site contains 3.00 acres. The site is composed of Maple, Oak, Black Walnut, American Sycamore and other species of trees, shrubs and plants. No legumes occur within the site. No threatened or endangered species are known to occur within the site. A stream and water springs occur within the site. The soil types at this site are Hosmer Silt Loam (HoB2) (2-6% slopes, eroded), Hosmer Silt Loam (HoC2) (6-12% slopes, eroded) and Wellston Silt Loam (WeE2) (18-25% slopes, eroded). These soils consist of moderately well drained to well drained. The potential for surface water runoff is medium to very high. Permeability is moderate. Houses and businesses occur adjacent to the site. The site has had no prior treatment. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Vigo-2: The proposed treatment site contains 1.00 acre. The site is composed of Maple, Ash, American Sycamore, Sassafrass, American Elm, Honey Locust, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Parke Silt Loam (PaB2) (2-6% slopes, eroded) and Alford Silt Loam (AlD3) (12-18% slopes, severely eroded). These series of soils consist ofwell drained soils and the potential for surface water runoff is low to very high. Permeability is moderate. No houses occur on the site. The site was treated with Clopyralid in 2008-2010, and was treated with Clopyralid and Glyphosate in 2011 and 2012. This site has a medium density population and Clopyralid, Glyphosate and Metsulfuron are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Warrick-1: The proposed treatment site contains 1.67 acres. The site is composed of Maple, Black Cherry, American Elm, Euonymus, Honey Locust, Black Locust and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Wheeling Silt Loam (WhB2) (2-6% slopes, eroded) and Weinbach Silt Loam (WbA) (0-2 % slopes). The Wheeling series of soils are well drained and the Weinbach series of soils are somewhat poorly drained. The potential for surface water runoff in Wheeling soils is low to medium and slow in Weinbach soils. Permeability in Wheeling soils is moderate and very slow

in Weinbach soils. Houses occur adjacent to the site. The site was treated with Clopyralid in 2009-2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Clopyralid will also allow for future increased site accessibility and selective cut stump treatments. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Warrick-2: The proposed treatment site contains 7.92 acres. The site is composed of Maple, Flowering Dogwood, Black Walnut, Pine, Oak, American Elm, Eastern Redbud and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. Drainage ditches occur within the site. The soil types at this site are Zanesville Silt Loam (ZaD3) (12-18% slopes, severely eroded), Tilsit Silt Loam (TtB2) (2-6% slopes, eroded), Tilsit Silt Loam (TsB2) (2-6% slopes, eroded) and Zanesville Silt Loam (ZaC3) (6-12% slopes, severely eroded). These soils are moderately well drained to well drained. The potential for surface water runoff in Zanesville soils is is medium and negligible to medium in Tilsit soils. Permeability in these soils is moderate above the fragipan and slow in the fragipan. No houses occur on the site. The site is adjacent to Lincoln State Park property. The site was treated with Clopyralid in 2009-2011 and with Clopyralid and Glyphosate in2012. This site has a medium density population and Clopyralid and Glyphosate are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Thus, there is a low risk of erosion potential at the site.

Washington-3: The proposed treatment site contains 2.60 acres. The site is composed of Oak, Tulip Poplar, American Beech, Hickory, Virginia Pine, Eastern Redbud and other species of trees, shrubs and plants. Legumes occur within the site. No threatened or endangered species are known to occur within the site. No water sources occur within the site. The soil types at this site are Crider Silt Loam (CoC2) (6-12% slopes, eroded) and Hagerstown-Caneyville Silt Loam (HeD2) (12-18% slopes, eroded). These soils are well drained. The potential for surface water runoff in Crider soils is low to high and medium to very high in Hagerstown-Caneyville soils. Permeability is moderate in Crider soils and slow to moderate in Hagerstown-Caneyville soils. No houses occur on the site. The site was treated with Clopyralid in 2008 to 2011, and was treated with Clopyralid and Glyphosate in 2009, 2010 and 2012. This site has a medium density population and Clopyralid, Glyphosate and Metsulfuron are proposed for 2013. Clopyralid is a selective herbicide and will preserve native vegetation and may reduce or eliminate the need for erosion control measures. Glyphosate will be applied in a selective manner and as a spot treatment and/or cut stump application for large vines growing in trees. Cut stump applications reduce the need for large volume foliar applications. Metsulfuron will be applied in a selective manner and as a spot treatment. Thus, there is a low risk of erosion potential at the site.

Table 3. Definitions for Descriptions of Proposed Treatment Sites

ENDANGERED SPECIES	The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.
FRAGIC SOILS	Fragic soil properties are the essential properties of a fragipan.
FRAGIPAN	Brittle subsurface restricting water flow and root penetration, usually loamy textured and weakly cemented.
INDIANA CLASSIFIED FOREST OR WILDLANDS	A minimum of 10 contiguous acres supporting a growth of native or planted trees, native or planted grasslands, wetlands or other acceptable types of land cover that have been set aside and managed for the production of timber, wildlife habitat and watershed protection.
SPECIES OF SPECIAL CONCERN	A species is considered a species of special concern if, although the species is not endangered or threatened, it is extremely uncommon in its range, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.
SURFACE WATER RUNOFF	The water flow that occurs when the soil is infiltrated to full capacity and excess water from rain, meltwater, or other sources flows over the land. This is a major component of the water cycle, and the primary agent in water erosion
THREATENED SPECIES	A species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, as defined in the Endangered Species Act.

3.2 Threatened and Endangered Species

The IDNR Environmental Unit reviewed the proposed project and determined that six of the proposed sites had special concern species recorded within a half mile of the site. Little spectaclecase mussel (*Villosa lienosa*) is a state species of special concern recorded in Sand Creek near the Jennings 9, 10 and 11 sites. Roundleaf water-hyssop (*Bacopa rotundifolia*) is a state threatened plant species recorded near the Crawford-4 site. The barn owl (*Tyto alba*) is a state endangered species recorded near the Jennings-12 site. The northern crawfish frog (*Rana areolata circulosa*) is a state endangered species recorded near the Sullivan-2 site.

"The Division of Nature Preserves does not anticipate any impacts to the listed plant species as a result of this project." (Appendix B – Letter from IDNR Environmental Unit).

The IDNR Environmental Unit stated, "We don't foresee any impacts to the barn owl as a result of these treatments." (Appendix B – Letter from IDNR Environmental Unit).

The IDNR Environmental Unit stated, "Regardless of the herbicide used, it should never be sprayed directly into the stream and prevailing winds should be considered to avoid unintentionally treating the stream in addition to the targeted areas." (Appendix B – Letter from IDNR Environmental Unit).

3.3 Protection of Historic Properties

The IDNR, Division of Historic Preservation and Archaeology reviewed the proposed project and determined that, "Based on our analysis, we do not believe that any historic properties will be altered, demolished, or removed by the proposed project." (Appendix B – Letter from IDNR, Division of Historic Preservation and Archaeology).

4.0 ENVIRONMENTAL CONSEQUENCES

This section is the scientific and analytic basis for the comparison of alternatives. It describes the probable consequences (effects) of each alternative for each issue. Environmental consequences are summarized in Table 2 for each combination of the alternatives and issues.

4.1 Effects on Nontarget Organisms and Environmental Quality (Issue 1).

Alternative 1 – No action (no proposed project). No treatment of the proposed sites would allow this invasive plant species to continue to spread and displace native plant species. This change in plant habitat can cause the loss of habitat and food for existing wildlife, alter soil chemistry and structure, increase ozone levels and replace and possibly lead to the local extinction of native sensitive, threatened or endangered species. Increased growth of kudzu populations would increase the amount of kudzu leaf surface area available to serve as hosts for other invasive pests, such as Asian soybean rust (*Phakopsora pachyrhizi*) which is threat to soybean crops and the bean plataspid (*Megacopatera cribraria*) which is a threat to soybean crops and other legume crops.

Alternative 2 – Treatment with clopyralid. Treatment of the proposed sites with clopyralid would cause severe injury to plants in the following families if applications were made directly to plants in these families or by indirect root uptake from treated soil: Asteraceae (sunflower family), Fabaceae (legume family), Solanaceae (nightshade family), Polygonaceae (knotweed family), and Violaceae (violet family). There are no restrictions on grazing or hay harvest following application of clopyralid at labeled rates. Plant residues, manure, straw and hay from treated areas or from animals that have grazed in treated areas should not be used on land with the sensitive plant families listed above. (See Transline and Clopyralid 3 Product Labels – Appendix C) Application of clopyralid over actively growing conifers can cause needle curling. (See Supplemental Labeling for Transline – Appendix C) The potential for mobility in soil is very high for both clopyralid and the inactive ingredient isopropanol. It is advised not to apply clopyralid products where soils have a rapid to very rapid permeability throughout the profile (such as loamy sand to sand) and the water table of an underlying aquifer is shallow, or to soils that would allow direct introduction into an aquifer. Clopyralid is not to be applied directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. (See Transline and Clopyralid 3 Material Safety Data Sheets – Work and Safety Plan)

A slight risk of an application accident or spill exists when conducting herbicide treatments. A work and safety plan is required by the IDNR prior to program implementation. The plan outlines guidelines for herbicide loading and conditions for safe applications.

Alternative 3 – Treatment with glyphosate. Direct contact with foliage, green stems, exposed non woody roots, crops fruits and desirable plant or tree species should be avoided to prevent injury or destruction of those plants. (See AquaNeat Product Label – Appendix C) Glyphosate is readily degraded by soil microbes to AMPA (aminomethyl phosphonic acid) that is further degraded to carbon dioxide. Glyphosate and AMPA are unlikely to enter ground water due to their strong adsorptive characteristics. Terrestrially applied glyphosate has the potential to move into surface waters through soil erosion because it may be adsorbed into soil particles suspended in the runoff. Aquatic applications registered for certain formulations may also result in glyphosate entering surface waters. Complete degradation is slow, but dissipation in water is rapid because glyphosate is bound in sediments and has low biological availability to aquatic organisms. These characteristics suggest a low potential for bioconcentration in aquatic organisms and this has been verified by laboratory investigations of glyphosate bioconentration in numerous marine and freshwater organisms with and without soil. (See AquaNeat Material Safety Data Sheet – Work and Safety Plan)

A slight risk of an application accident or spill exists when conducting herbicide treatments. A work and safety plan is required by the IDNR prior to program implementation. The plan outlines guidelines for herbicide loading and conditions for safe applications.

Alternative 4 – Treatment with metsulfuron-methyl. Treatment with metsulfuron-methyl at extremely low concentrations is injurious to plants. Non target plants may be adversely effected by drift and run-off. Metsulfuron-methyl should not be applied directly to water, or to areas where surface water is present. (See Escort XP Product Label – Appendix C)

A slight risk of an application accident or spill exists when conducting herbicide treatments. A work and safety plan is required by the IDNR prior to program implementation. The plan outlines guidelines for herbicide loading and conditions for safe applications.

Alternative 5 – Treatment with clopyralid, glyphosate, and/or metsulfuron-methyl. The nontarget and environmental consequences stated above for Alternatives 2, 3, and 4 apply to this alternative.

4.2 Human Health and Safety (Issue 2).

Alternative 1 – No action (no proposed project). For this alternative, there would be no proposed project and the risk of human exposure to herbicides during treatments would not exist.

Alternative 2 - Treatment with clopyralid. Exposure of clopyralid to skin may cause slight irritation and local redness based on toxicity studies. Ingestion of clopyralid has a very low toxicity and harmful effects are not anticipated from swallowing small amounts based on toxicity studies. However, no significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed. Inhalation of clopyralid mist may cause irritation of the upper respiratory tract (nose and throat) and lungs. Excessive exposure (400 ppm) to isopropanol (an inactive ingredient in the product Transline) may cause eye, nose and throat irritation. Incoordination, confusion, hypotension, hypothermia, circulatory collapse, respiratory arrest and death may follow a longer duration or higher levels. Observations in animals include middle ear lining damage upon exposure to vapors of isopropanol. However, the relevance of this to humans is unknown. Repeated exposure to clopyralid is not expected to cause significant adverse affects, except at very high aerosol concentrations. Repeated excessive exposure to clopyralid may aggravate preexisting lung disease. Prolonged overexposure may cause effects to the liver. Available data has shown little or no evidence of carcinogenicity. (Transline and Clopyralid 3 Material Safety Data Sheets – See Work & Safety Plan)

A slight risk of an application accident or spill exists when conducting herbicide treatments. A work and safety plan is required by the IDNR prior to program implementation. The plan outlines guidelines for herbicide loading and conditions for safe applications.

Alternative 3 – Treatment with glyphosate. Exposure of glyphosate to eye and skin may cause slight irritation based on toxicity studies. Ingestion of glyphosate is slightly toxic based on toxicity studies. However, no significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed. Toxicity of glyphosate is low if inhaled. There are no known medical conditions aggravated by exposure to glyphosate. Prolonged overexposure may cause effects to the liver. EPA has given glyphosate a Group E classification (evidence of non-carcinogenicity in humans). (AquaNeat Material Safety Data Sheet – See Work & Safety Plan)
A slight risk of an application accident or spill exists when conducting herbicide treatments. A work and safety plan is required by the IDNR prior to program implementation. That plan outlines guidelines for herbicide loading and conditions for safe applications.

Alternative 4 - Treatment with metsulfuron-methyl.

Exposure of metsulfuron-methyl to eye and skin may cause irritation with discomfort, pain, redness, skin rash, itching or swelling of the skin, and visual impairment based on toxicity studies. Metsulfuron-methyl is not likely to be hazardous if inhaled or ingested. None of the components present in Escort XP at concentrations equal to or greater than 0.1% are listed by the International Agency for Research on Cancer (IARC), National Toxicology Program (NTP), or Occupational Safety and Health Administration (OSHA), as a carcinogen. (Escort XP Material Safety Data Sheet – See Work & Safety Plan) No information was found on medical conditions aggravated by exposure to metsulfuron-methyl.

A slight risk of an application accident or spill exists when conducting herbicide treatments. A work and safety plan is required by IDNR prior to program implementation. The plan outlines guidelines for herbicide loading and conditions for safe applications.

Alternative 5 - Treatment with clopyralid, glyphosate, and/or metsulfuron-methyl.

The human health and safety consequences stated for alternatives 2, 3 and 4 apply to this alternative.

4.3 Likelihood of Success of the Project (Issue 3).

Alternative 1 – No action (no proposed project). The objectives of this proposed project; 1) eradicate kudzu populations from the proposed treatment sites to prevent populations from spreading further north in the State of Indiana, 2) manage kudzu population growth in the proposed treatment sites in areas where eradication is not feasible, and 3) decrease kudzu leaf surface area to reduce potential reservoirs for invasive insects and pathogens, would not be met with this alternative.

Alternative 2 – Treatment with clopyralid. Success is likely with this alternative at all sites with varying density populations. However, 38 of the 51 proposed treatment sites have water sources located within the site and clopyralid alone cannot be used at those sites.

Alternative 3 - Treatment with glyphosate. Success is likely with this alternative at 45 of the 51 proposed treatment sites which have medium to low density populations. However, six of the proposed sites have high density populations and success is not likely at these sites.

Alternative 4 – Treatment with metsulfuron-methyl. Success is likely with this alternative at low density sites that have been treated previously. However, broad spectrum treatments at all sites would increase the risk of non target injury.

Alternative 5 - Treatment with clopyralid, glyphosate, and/or metsulfuron-methyl. Project success is optimized with this alternative when treatment selection criteria are used to determine the use of clopyralid, glyphosate, metsulfuron-methyl alone or in combination for each site. Treatment selection criteria used to evaluate each site are: 1) presence of susceptible non target

species, 2) soil type, content and slope, 3) presence of water sources, 4) risk to human health and safety, and 5) likelihood of success.

4.4 Economic and Political Impacts of Treatment vs. Non-Treatment (Issue 4).

Alternative 1 – No action (no proposed project). If no action is taken, kudzu populations would continue to increase and there would likely be an increase of complaints from landowners who want to eliminate the invasive plant from their property. If sites are left to increase in size, it will take increased funds, labor, equipment and erosion work to treat sites once they are larger. The continued or increasing populations of kudzu may increase the need and cost for applications of fungicides and insecticides to control additional invasive species that use kudzu as a host. If no action is taken, kudzu may serve as a host plant for invasive species which can significantly affect soybean production yields. The soybean production industry in Indiana adds approximately $2.8 billion to the state economy each year (Indiana Soybean Alliance 2011).

Alternative 2 (Treatment with clopyralid), 3 (Treatment with glyphosate), 4 (Treatment with metsulfuron methyl) and, 5) Treatment with a combination of clopyralid, glyphosate, and/or metsulfuron methyl. With these alternatives, the amount of kudzu leaf surface area would be reduced, decreasing availability of the kudzu to harbor invasive insect pests or disease and potentially decreasing additional pesticide use in the future. Populations would be managed, decreasing costs of control for private landowners and decreased use of land taken over by kudzu.

4.5 Unavoidable Adverse Effects

No unavoidable adverse effects were identified for this proposed project.

4.6 Irreversible and Irretrievable Commitments of Resources

An irretrievable commitment is one in which a resource product or use is lost for a period of time while managing for another (USDA 1995, Vol. II, p. 4-93).

Twenty-four sites have a low number of trees (Honey Locust, Black Locust, Eastern Redbud and Kentucky Coffeetree) in the family Fabaceae which are susceptible to the herbicide Clopyralid proposed for use at that site. Landowners have been informed of these potential losses and have expressed to IDNR that the benefit of removing kudzu from the site is greater than the adverse effect of potentially losing a few susceptible trees.

4.7 Cumulative Effects

Cumulative effects (both direct and indirect) are the incremental impacts of the action when added to past, present, and reasonably foreseeable future actions, which are collectively significant.

See Table 3 below for a summary of the treatment history of the 2013 proposed treatment sites.

No threatened or endangered species were identified at the 51 proposed sites, therefore no direct or indirect adverse effects are expected to any of these listed species. The IDNR Environmental Unit was consulted and determined that six of the proposed sites had species of concern recorded within a half mile of the site. Little spectaclecase mussel (*Villosa lienosa*) is a state species of special concern recorded in Sand Creek near the Jennings 9, 10 and 11 sites. Roundleaf water-hyssop (*Bacopa rotundifolia*) is a state threatened plant species recorded near the Crawford-4 site. The barn owl (*Tyto alba*) is a state endangered species recorded near the Jennings-12 site. The northern crawfish frog (*Rana areolata circulosa*) is a state endangered species recorded near the Sullivan-2 site.

Soil type, slope, erosion potential and pre-existing erosion of the sites have been evaluated in the decision making process to determine which herbicide would be used at each site to avoid herbicide runoff and leaching into nontarget areas.

Evaluation of the presence or absence of water sources at the proposed sites has been conducted and used in the decision making process to determine which herbicide would be used at each site to avoid water contamination and ensure proper use of herbicides according to product label requirements.

Of the 51 proposed treatment sites, 6 sites have had no prior treatment.

Two beneficial cumulative effects were identified for this project:

1) Use of the Integrated Pest Management strategy for this proposed project will help manage and eradicate kudzu at these sites and lead to restoration of these sites to a more native plant species diversification.
2) The reduced leaf surface area resulting from the treatments will reduce the potential for kudzu populations to harbor invasive insects and pathogens.

In conclusion, no adverse cumulative effects were identified for this project.

Table 5. Summary of Treatment History of 2013 Proposed Treatment Sites by Year and Treatment Method*.

County	**2013 Site Name**	**Site Treatment History****							**2013 Proposed Treatment**
		2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	
Clark	Clark-2	--	--	--	--	--	--	C	CG
Clark	Clark-3	--	--	--	--	--	--	--	G
Clark	Clark-4	--	--	--	--	--	--	C	CG
Clark	Clark-5	--	--	--	--	--	--	C	CG
Clark	Clark-6	--	--	--	--	--	--	C	CG
Clark	Clark-7	--	--	--	--	--	--	C	CG
Crawford	Crawford-4	--	--	--	--	--	C	CG	CG
Crawford	Crawford-5	--	--	--	--	--	--	CG	CG
Crawford	Crawford-6	--	--	--	--	--	--	--	CG
Clay	Clay-5	--	--	C	C	CG	CG	CG	CGM

Clay	Clay-6	--	--	--	C	C	C	--	GM
Dubois	Dubois-1	--	--	--	C	CG	CG	CG	CG
Dubois	Dubois-2	--	--	--	C	CG	CG	CG	CG
Dubois	Dubois-3	--	--	--	--	--	C	CG	CG
Dubois	Dubois-4	--	--	--	--	--	C	CG	CG
Dubois	Dubois-5	--	--	--	--	--	--	--	C
Dubois	Dubois-6	--	--	--	--	--	--	--	C
Floyd	Floyd-4	--	--	--	--	--	--	--	CG
Gibson	Gibson-1	--	--	--	--	--	--	C	CG
Gibson	Gibson-3	--	--	--	--	--	--	C	CG
Greene	Greene-1	--	--	--	C	C	--	--	M
Greene	Greene-4	--	C	C	C	C	CG	--	GM
Harrison	Harrison-6	--	--	--	--	--	--	C	CG
Harrison	Harrison-12	--	--	--	--	--	--	--	C
Jennings	Jennings-1	--	--	--	C	C	CG	C	CGM
Jennings	Jennings-2	--	--	--	C	C	CG	C	CGM
Jennings	Jennings-5	--	--	C	C	C	GM	--	M
Jennings	Jennings-6	--	--	--	C	C	--	C	CG
Jennings	Jennings-9	--	--	--	--	CG	C	CG	CG
Jennings	Jennings-10	--	--	--	--	CG	C	G	CG
Jennings	Jennings-11	--	--	--	--	--	CG	CG	CG
Jennings	Jennings-12	--	--	--	--	--	C	C	C
Johnson	Johnson-1	--	--	C	C	G	--	--	MG
Lawrence	Lawrence-3	C	C	C	--	--	CM	--	M
Lawrence	Lawrence-4	--	--	C	C	C	CG	--	M
Lawrence	Lawrence-8	--	--	--	--	C	C	CG	CG
Lawrence	Lawrence-11	--	--	--	--	--	--	C	CG
Martin	Martin-3	--	--	CG	CG	C	CG	CG	CGM
Martin	Martin-4	--	--	--	--	C	C	CG	CG
Martin	Martin-5	--	--	--	--	--	--	C	CG
Martin	Martin-6	--	--	--	--	--	--	--	C
Morgan	Morgan-3	--	--	--	--	--	C	C	CG
Orange	Orange-3	--	--	--	--	--	--	C	CG
Posey	Posey-2	--	--	--	--	--	--	CG	CG
Sullivan	Sullivan-1	--	--	--	C	C	CG	CG	CG
Sullivan	Sullivan-2	--	--	--	--	--	C	C	CG
Vanderburgh	Vanderburgh-4	--	--	--	--	--	--	--	CG
Vigo	Vigo-2	--	--	C	C	C	CG	CG	CGM
Warrick	Warrick-1	--	--	--	C	C	C	C	CG
Warrick	Warrick-2	--	--	--	C	C	C	CG	CG
Washington	Washington-3	--	--	C	C	C	C	CG	CGM

*Treatment Method: C= Clopyralid
G=Glyphosate
CG= Clopyralid + Glyphosate
CGM= Clopyralid+Glyphosate+Metsulfuron
GM= Glyphosate+Metsulfuron
M= Metsulfuron

**Indicates previous treatment or partial treatment of the site and what treatment method was used.

Table 6. Summary of 2013 Proposed Treatment Sites by Acreage and Treatment Method*.

County	2013 Site Name	Acreage	2013 Proposed Treatment Method
Clark	Clark-3	0.64	G
	(Total)	**0.64**	**G**
Dubois	Dubois-5	0.10	C
Dubois	Dubois-6	0.03	C
Harrison	Harrison-12	0.02	C
Jennings	Jennings-12	0.38	C
Martin	Martin-6	0.14	C
	(Total)	**0.67**	**C**
Clark	Clark-2	0.14	CG
Clark	Clark-4	1.36	CG
Clark	Clark-5	0.32	CG
Clark	Clark-6	0.02	CG
Clark	Clark-7	0.37	CG
Crawford	Crawford-4	0.17	CG
Crawford	Crawford-5	0.83	CG
Crawford	Crawford-6	0.23	CG
Dubois	Dubois-1	1.20	CG
Dubois	Dubois-2	2.41	CG
Dubois	Dubois-3	0.05	CG
Dubois	Dubois-4	0.43	CG
Floyd	Floyd-4	1.02	CG
Gibson	Gibson-1	1.66	CG
Gibson	Gibson-3	0.44	CG
Harrison	Harrison-6	2.69	CG
Jennings	Jennings-6	1.57	CG
Jennings	Jennings-9	1.85	CG
Jennings	Jennings-10	0.19	CG
Jennings	Jennings-11	0.05	CG
Lawrence	Lawrence-8	0.33	CG
Lawrence	Lawrence-11	0.32	CG
Martin	Martin-4	0.68	CG
Martin	Martin-5	0.28	CG
Morgan	Morgan-3	1.45	CG
Orange	Orange-3	1.55	CG
Posey	Posey-2	0.65	CG
Sullivan	Sullivan-1	1.25	CG
Sullivan	Sullivan-2	4.64	CG
Vanderburgh	Vanderburgh-4	3.00	CG
Warrick	Warrick-1	1.67	CG
Warrick	Warrick-2	7.92	CG
	(Total)	**40.74**	**CG**
Clay	Clay-5	7.00	CGM
Jennings	Jennings-1	1.01	CGM
Jennings	Jennings-2	0.50	CGM
Martin	Martin-3	1.61	CGM
Vigo	Vigo-2	1.00	CGM
Washington	Washington-3	2.60	CGM
	(Total)	**13.72**	**CGM**

Clay	Clay-6	0.56	GM
Greene	Greene-4	1.19	GM
Johnson	Johnson-1	0.64	GM
	(Total)	**2.39**	**GM**
Greene	Greene-1	0.14	M
Jennings	Jennings-5	0.65	M
Lawrence	Lawrence-3	0.51	M
Lawrence	Lawrence-4	0.36	M
	(Total)	**1.66**	**M**

*Treatment Method: C= Clopyralid
G=Glyphosate
CG= Clopyralid + Glyphosate
CGM= Clopyralid+Glyphosate+Metsulfuron
GM= Glyphosate+Metsulfuron
M= Metsulfuron

4.8 Other Information

Mitigation

The Indiana Kudzu Management Plan will implement the following safeguards and mitigating measures:

- Implementation of a Work and Safety Plan.
- Employees of state agencies monitoring the treatments will receive training on treatment methods to be able to answer questions from the public.
- Application equipment will be calibrated for accurate application of treatment material.
- Treatment application will not occur if rain is anticipated with 4 hours of completion of the application.
- Treatment will be avoided or stopped if winds are above 15 mph, as stated in the Work and Safety Plan.
- Herbicide applications used at all sites will not be applied directly to the water.
- Herbicides will be applied as to avoid contact with any headstones, grave markers, or memorials.

Monitoring

- The applications will be monitored by IDNR personnel and the applicator will maintain the applications within the boundaries of the proposed treatment sites.
- IDNR personnel will complete a field record sheet for each site which states the climate and site conditions during the time of application.
- Sites will be visited post treatment by IDNR personnel to evaluate the effectiveness of the treatment and document this information along with any additional changes in the site.

5.0 LIST OF PREPARERS

Phil Marshall, State Entomologist and Forest Health Specialist, Division of Entomology and Plant Pathology and Division of Forestry (respectfully), Indiana Department of Natural Resources, 402 W. Washington Street, Room 290/296W, Indianapolis, IN 46204.
EA Responsibility: Deciding official on the proposed kudzu eradication project and in review of the environmental assessment.
Experience and Education: Experience as Forest Health Specialist since 1974 and M.F., Duke University in Forest Entomology and Pathology; B.A., Catawba College in Pre-Forestry.

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6.0 LIST OF PERSONS AND AGENCIES CONSULTED

Eric Bitner, Nursery Inspector and Compliance Officer, IDNR Entomology and Plant Pathology, P.O. Box 82, Jeffersonville, IN 47131. Consultation on mapping of the 2013 proposed treatment sites.

James Glass, Director, IDNR Division of Historic Preservation and Archaeology, 402 West Washington Street, Room W274, Indianapolis, IN 46204. Consultation on historical properties of concern for the 2013 proposed project.

Spencer Goehl, Executive Director, Eco Logic LLC., 3940 West Farmer Avenue, Bloomington, IN 47403. Past and ongoing consultation on treatment and management options for control of kudzu.

Brenda Huter, Stewardship Coordinator, IDNR Division of Forestry, 402 West Washington Street, Room W296, Indianapolis, IN 46204. Consultation on State Classified Forest sites of concern for the 2013 proposed project.

Bill Johnson, Professor of Weed Science, Department of Botany and Plant Pathology, Lilly Hall of Life Sciences, Purdue University, 915 W. State Street, West Lafayette, IN 47907. Past consultation on half life properties of herbicides.

Scott Kinzie, Nursery Inspector and Compliance Officer, IDNR Entomology and Plant Pathology, 402 West Washington Street, Room 290W, Indianapolis, IN 46204. Consultation on mapping of the 2013 proposed treatment sites.

Glenn Nice, Weed Science Extension Professional, Department of Botany and Plant Pathology, Lilly Hall of Life Sciences, 915 West State Street, Purdue University, West Lafayette, IN 47907. Past consultation on herbicide options for control of kudzu.

Jody Shimp, Administrator, National Heritage Program, Illinois Department of Natural Resources, 11731 State Hwy 37, Benton, Illinois 62812. Past consultation on the effectiveness of different herbicide and management options for kudzu control.

Christie Stanifer, Environmental Coordinator, Environmental Unit, IDNR Division of Fish and Wildlife, 402 West Washington Street, Room 264W, Indianapolis, IN 46204. Consultation on Natural Heritage Program data and IDNR, Div. of Fish and Wildlife concerns within the 2013 proposed treatment sites.

Joe Williams, District Conservationist, USDA NRCS, 2524 East National Highway, Washington, IN 47501. Past consultation on models and methods for implementation of soil erosion control techniques.

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